STATEMENT OF LEGAL AND FACTUAL BASIS

Low Moor Combustion Turbine Station
Low Moor, Virginia
Permit No. VA-20675

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Virginia Electric and Power Company has applied for a Title V Operating Permit for its Low Moor facility. The Department has reviewed the application and has prepared a Title V Operating Permit.

Engineer/Permit Contact:_____ Date:_____

FACILITY INFORMATION

Permittee
Virginia Electric and Power Company
5000 Dominion Boulevard
Glen Allen, VA 23060

Facility
Low Moor Combustion Turbine Station
Route 616
Low Moor, VA

AIRS ID No. 51-005-0024

SOURCE DESCRIPTION

SIC Code: 4911 - The Low Moor Combustion Turbine Station generates electric power during peak demand periods using four #2 fuel oil-fired simple cycle combustion turbines. One of the turbines is equipped with a diesel starter engine for blackstart capability. All fuel-burning units were constructed in the summer of 1971.

The plant is by definition a Title V major source due to potential emissions of criteria pollutants sulfur dioxide and nitrogen oxides in excess of 100 tpy. It is located in an attainment area for criteria pollutants. The turbines all predate NSPS Subpart GG applicability, having been constructed prior to 1977. Therefore, Subpart GG provisions constitute inapplicable requirements under this permit. A MACT standard for combustion turbines is being developed, but has not yet been proposed or promulgated; it is expected to be proposed by 2002. No alternative operating scenarios have been requested. Voluntary control devices may be installed at the facility in the future.

The facility was issued an Exclusionary General Permit on April 15, 1998. However, DEQ was notified in August 1999 that annual emissions had exceeded the 50 tons per year actual emissions level for NOx. The facility subsequently submitted a Title V application in June 2000, and the resulting Title V permit, once issued, will supercede the EGP.

COMPLIANCE STATUS

The facility is a remotely operated peaking facility and is inspected once a year when in operation. It was last inspected on September 3, 1999 and is currently considered in compliance.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units at this facility consist of the following :

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
Fuel Burning Equipment							
ES-1	EP-1	Unit 1 Combustion Turbine (General Electric PB5221)	323×10^6 BTU/hr input (maximum design capacity)	-	-	-	-
ES-2	EP-2	Unit 2 Combustion Turbine (General Electric PB5221)	323×10^6 BTU/hr input (maximum design capacity)	-	-	-	-
ES-3	EP-3	Unit 3 Combustion Turbine (General Electric PB5221)	323×10^6 BTU/hr input (maximum design capacity)	-	-	-	-
ES-4	EP-4	Unit 4 Combustion Turbine (General Electric PB5221)	323×10^6 BTU/hr input (maximum design capacity)	-	-	-	-
ES-5	EP-5	Unit 4 Blackstart Internal Combustion Engine (Industrial Applications Model V785)	6.72×10^6 BTU/hr input; 300 hp output	-	-	-	-

*The Size/Rated capacity is provided for informational purposes only, and is not an applicable requirement.

EMISSIONS INVENTORY

Emissions summarized in the following table are derived from the 1999 permit application emission inventory. (These were changed from the 1999 annual emission update sent to DEQ earlier, due to a change in the AP-42 emission factors.) A copy of the report is attached as Attachment A.

1999 Pollutant Emissions (Plantwide Total)	
Pollutant	Tons Emitted
Criteria Pollutants	
PM10	0.95
VOC	0.04
NO_X	69.99
SO_2	16.06
CO	0.27
Lead	0.001

EMISSION UNIT APPLICABLE REQUIREMENTS – ES-1, ES-2, ES-3, ES-4 and ES-5

As these units were constructed in 1971, no minor NSR permits have been issued. However, the following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:

9 VAC 5-80-110, Federal Operating Permits for Stationary Sources (specifying approved fuels, and operation and maintenance of equipment)

9 VAC 5-40-900, Emission Standards for Fuel Burning Equipment (standard for particulate matter and emission allocation system). Allowable emissions from units ES-1 through ES-4, in pounds of particulate per million BTU input, are calculated using the following formula:

Maximum Allowable Emission Ratio (E) = $1.0906H^{-0.2594}$

where H is the total capacity of all fuel burning units at a stationary source in millions of BTUs per hour. (Note that unit ES-5, which is an internal combustion engine, is not considered "fuel burning equipment" for purposes of this regulation, and thus is not included in this calculation.) The total capacity at 100% use load was originally established in a DEQ letter to Virginia Electric & Power Company dated 2/5/1980, and was based upon 312 x 10^6 BTU/hr input per unit, or a total of 1248 x 10^6 BTU/hr input with all four units operating. However, a letter dated 2/15/01 from Bob Bisha to DEQ revises the maximum heat input (based upon design peak unit rating adjusted for site conditions) to 323 x 10^6 BTU/hr input per unit, or a total of 1292 x 10^6 BTU/hr input with all four units operating. The current allocation is:

$E = 1.0906 \times (1292)^{-0.2594} = 0.170$ lbs/mmBTU input

Allowable particulate emissions are the product of the emission ratio E and the allowable heat input in mmBTU/hr. Therefore:

Maximum Allowable Emissions = 0.170 x 323 = 54.9 lbs/hr (per turbine), and
54.9 x 4 = 219.7 lbs/hr (total)

However, potential particulate emissions may be calculated based upon the emission factor found in AP-42, Table 3.1-2a, as follows:

0.012 lbs/mmBTU input x 1292 mmBTU/hr = 15.5 lbs/hr (total)

Potential emissions are therefore much lower than allowable. Consequently visible emissions checks and records of fuel consumption are considered adequate to assure compliance with the PM limit for the turbines.

<u>9 VAC 5-40-930, Emission Standards for Fuel Burning Equipment</u> (standard for sulfur dioxide). Allowable emissions, in pounds of sulfur dioxide per hour, are calculated using the following formula:

Maximum Allowable Emissions (S) = 2.64K

where K is the allowable heat input at total capacity in mmBTU/hr. Therefore:

S = 2.64 x 323 = 852.7 lbs/hr (each turbine)

Potential SO_2 emissions are actually much lower than allowable due to another condition for these turbines limiting the fuel to distillate (Nos. 1 or 2) fuel oil. The No. 2 fuel oil definition limits maximum sulfur content to 0.5% by weight, which calculates to only approximately 0.51 lb SO_2/million BTU when using 2000 AP-42 emission factors. Consequently, the fuel sulfur limitation and records of fuel consumption and supplier certifications are considered adequate to assure compliance with the SO_2 limit for the turbines.

9 VAC 5-40-80 and 5-40-940, Existing Source Standard for Visible Emissions

Monitoring

9 VAC 5-40-50 requires that records of all emissions data and operating parameters necessary to demonstrate compliance with the permit be maintained. (See Recordkeeping, below.)

Recordkeeping

The permit includes requirements for maintaining records of all monitoring and testing required by the permit. These records include the annual throughput of distillate oil (in 1000 gallons) for the turbines, calculated monthly as the sum of each consecutive twelve (12) month period; all fuel supplier certifications; and the sulfur content of the oil burned in the turbines and engine.

Testing

The permit does not require source tests. A table of test methods has been included in the permit if testing is performed. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Streamlined Requirements

NA

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal operating permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upsets, within four (4) daytime business hours.

STATE ONLY APPLICABLE REQUIREMENTS

NA

FUTURE APPLICABLE REQUIREMENTS

A MACT standard for combustion turbines is being developed, but has not yet been proposed or promulgated; it is expected to be proposed by fall of 2003. The facility may be subject to those requirements when promulgated.

INAPPLICABLE REQUIREMENTS

The Acid Rain program, the NOx Budget Trading program and NSPS Subpart GG provisions constitute inapplicable requirements under this permit.

COMPLIANCE PLAN

NA

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (9 VAC 5-80-720 B)	Rated Capacity (9 VAC 5-80-720 C)
IS-1	Fuel oil tank	9 VAC 5-80-720B	VOC	1,500,000 gals
IS-2	Lube oil systems	9 VAC 5-80-720B	VOC	4 @ 1700 gals
IS-3	Coolant/glycol systems	9 VAC 5-80-720B	VOC	4 @ 140 gals
IS-4	Oil/water separator (in-ground)	9 VAC 5-80-720B	VOC	20 gpm

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. All portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

A public notice appeared in the Roanoke Times and World-News on September 8, 2002 announcing a 30-day public comment period for this permit. Notice was also provided to West Virginia as an affected state. The public comment period ended on October 8, 2002. During the public comment period, comments were received from EPA and from the applicant. The proposed permit incorporated revisions made to the September 6, 2002 draft in response to these comments. No additional comments were received during EPA's 45-day review of the proposed permit.

STATEMENT OF LEGAL AND FACTUAL BASIS

Dominion - Low Moor CT Station
Low Moor, Virginia
Permit No. WCRO-20675

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Virginia Electric and Power Company has applied for a *modification to its* Title V Operating Permit *dated June 20, 2003* for its Low Moor facility. The Department has reviewed the application and has prepared a*n amended* Title V Operating Permit.

This permit modification is being issued to incorporate three changes:

- *include the Blackstart Engine (ES-5) as an insignificant emission unit,*
- *require visible emission observations (VEO's) according to actual operation instead of during semi-annual full load tests, and*
- *require different fuel monitoring and recordkeeping and delete the requirement for fuel supplier certifications.*

Engineer/Permit Contact:_____ Date:

Lillian Alexander
540/562-6783

*Air Permit Manager:*_____ *Date:*

Michael J. Scanlan, Ph. D.

***NOTE** - language added or changed from the original SOB is presented in Italics*

FACILITY INFORMATION

Permittee
Virginia Electric and Power Company
5000 Dominion Boulevard
Glen Allen, VA 23060

Facility
Dominion - Low Moor CT Station
Route 616
Low Moor, VA

AIRS ID No. 51-005-0024

SOURCE DESCRIPTION

SIC Code: 4911 - The Low Moor Combustion Turbine Station generates electric power during peak demand periods using four #2 fuel oil-fired simple cycle combustion turbines. One of the turbines is equipped with a diesel starter engine for blackstart capability. All fuel-burning units were constructed in the summer of 1971. *The Blackstart engine is an insignificant emission unit.*

The plant is by definition a Title V major source due to potential emissions of criteria pollutants sulfur dioxide and nitrogen oxides in excess of 100 tpy. It is located in an attainment area for criteria pollutants. The turbines all predate NSPS Subpart GG applicability, having been constructed prior to 1977. Therefore, Subpart GG provisions constitute inapplicable requirements under this permit. A MACT standard for combustion turbines *has been finalized but is not applicable to this facility*. No alternative operating scenarios have been requested. Voluntary control devices may be installed at the facility in the future.

The facility was issued an Exclusionary General Permit on April 15, 1998. However, DEQ was notified in August 1999 that annual emissions had exceeded the 50 tons per year actual emissions level for NOx. The facility subsequently submitted a Title V application in June 2000, and the resulting Title V permit, *superceded* the EGP.

COMPLIANCE STATUS

The facility is a remotely operated peaking facility and is inspected once a year when in operation. It was last inspected on *August 30, 2005* and is currently considered in compliance.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units at this facility consist of the following :

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
Fuel Burning Equipment							
ES-1	EP-1	Unit 1 Combustion Turbine (General Electric PB5221)	323×10^6 BTU/hr input (maximum design capacity)	-	-	-	-
ES-2	EP-2	Unit 2 Combustion Turbine (General Electric PB5221)	323×10^6 BTU/hr input (maximum design capacity)	-	-	-	-
ES-3	EP-3	Unit 3 Combustion Turbine (General Electric PB5221)	323×10^6 BTU/hr input (maximum design capacity)	-	-	-	-
ES-4	EP-4	Unit 4 Combustion Turbine (General Electric PB5221)	323×10^6 BTU/hr input (maximum design capacity)	-	-	-	-

*The Size/Rated capacity is provided for informational purposes only, and is not an applicable requirement.

EMISSIONS INVENTORY

Emissions summarized in the following table are derived from the 1999 permit application emission inventory. (These were changed from the 1999 annual emission update sent to DEQ earlier, due to a change in the AP-42 emission factors.) A copy of the report is attached as Attachment A.

1999 Pollutant Emissions (Plantwide Total)	
Pollutant	Tons Emitted
Criteria Pollutants	
PM10	0.95
VOC	0.04
NO_X	69.99
SO_2	16.06
CO	0.27
Lead	0.001

EMISSION UNIT APPLICABLE REQUIREMENTS – ES-1, ES-2, ES-3, and ES-4

As these units were constructed in 1971, no minor NSR permits have been issued. However, the following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:

9 VAC 5-80-110, Federal Operating Permits for Stationary Sources (specifying approved fuels, and operation and maintenance of equipment)

9 VAC 5-40-900, Emission Standards for Fuel Burning Equipment (standard for particulate matter and emission allocation system). Allowable emissions from units ES-1 through ES-4, in pounds of particulate per million BTU input, are calculated using the following formula:

Maximum Allowable Emission Ratio (E) = $1.0906H^{-0.2594}$

where H is the total capacity of all fuel burning units at a stationary source in millions of BTUs per hour. The total capacity at 100% use load was originally established in a DEQ letter to Virginia Electric & Power Company dated 2/5/1980, and was based upon 312 x 10^6 BTU/hr input per unit, or a total of 1248 x 10^6 BTU/hr input with all four units operating. However, a letter dated 2/15/01 from Bob Bisha to DEQ revises the maximum heat input (based upon design peak unit rating adjusted for site conditions) to 323 x 10^6 BTU/hr input per unit, or a total of 1292 x 10^6 BTU/hr input with all four units operating. The current allocation is:

$E = 1.0906 \times (1292)^{-0.2594} = 0.170$ lbs/mmBTU input

Allowable particulate emissions are the product of the emission ratio E and the allowable heat input in mmBTU/hr. Therefore:

Maximum Allowable Emissions = 0.170 x 323 = 54.9 lbs/hr (per turbine), and
54.9 x 4 = 219.7 lbs/hr (total)

However, potential particulate emissions may be calculated based upon the emission factor found in AP-42, Table 3.1-2a, as follows:

0.012 lbs/mmBTU input x 1292 mmBTU/hr = 15.5 lbs/hr (total)

Potential emissions are therefore much lower than allowable. Consequently visible emissions checks and records of fuel consumption are considered adequate to assure compliance with the PM limit for the turbines.

<u>9 VAC 5-40-930, Emission Standards for Fuel Burning Equipment</u> (standard for sulfur dioxide). Allowable emissions, in pounds of sulfur dioxide per hour, are calculated using the following formula:

Maximum Allowable Emissions (S) = 2.64K

where K is the allowable heat input at total capacity in mmBTU/hr. Therefore:

S = 2.64 x 323 = 852.7 lbs/hr (each turbine)

Potential SO_2 emissions are actually much lower than allowable due to another condition for these turbines limiting the fuel to distillate (Nos. 1 or 2) fuel oil. The No. 2 fuel oil definition limits maximum sulfur content to 0.5% by weight, which calculates to only approximately 0.51 lb SO_2/million BTU when using 2000 AP-42 emission factors. Consequently, the fuel sulfur limitation and records of fuel consumption and *on site fuel testing* are considered adequate to assure compliance with the SO_2 limit for the turbines.

9 VAC 5-40-80 and 5-40-940, Existing Source Standard for Visible Emissions

Monitoring
9 VAC 5-40-50 requires that records of all emissions data and operating parameters necessary to demonstrate compliance with the permit be maintained. (See Recordkeeping, below.)

Recordkeeping
The permit includes requirements for maintaining records of all monitoring and testing required by the permit. These records include the annual throughput of distillate oil (in 1000 gallons) for the turbines, calculated monthly as the sum of each consecutive twelve (12) month period; and the sulfur content of the oil burned in the turbines and engine.

Testing
The permit does not require source tests. A table of test methods has been included in the permit if testing is performed. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Permit conditions III. B . 2, 3 and 4 reflect changes to monitoring, recordkeeping and testing requirements.

Streamlined Requirements
Not Applicable

GENERAL CONDITIONS
The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal operating permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upsets, within four (4) daytime business hours.

STATE ONLY APPLICABLE REQUIREMENTS
Not Applicable

FUTURE APPLICABLE REQUIREMENTS

The Stationary Combustion Turbine MACT (YYYY) was finalized on March 5, 2004 and is not applicable to this facility since it is not a major source for HAPs. (Worst-case HAP [Manganese with an emission factor of 7.9 x 10^{-4} lb/MMBtu] would result in a total of 4.5 TPY from all four turbines at 8,760 hours of operation.)

INAPPLICABLE REQUIREMENTS

The Acid Rain program, the NOx Budget Trading program and NSPS Subpart GG provisions constitute inapplicable requirements under this permit.

COMPLIANCE PLAN

Not Applicable

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted (9 VAC 5-80-720 B)	Rated Capacity (9 VAC 5-80-720 C)
IS-1	Fuel oil tank	9 VAC 5-80-720B	VOC	1,500,000 gals
IS-2	Lube oil systems	9 VAC 5-80-720B	VOC	4 @ 1700 gals
IS-3	Coolant/glycol systems	9 VAC 5-80-720B	VOC	4 @ 140 gals
IS-4	Oil/water separator (in-ground)	9 VAC 5-80-720B	VOC	20 gpm
ES - 5	*Unit 4 Blackstart Internal Combustion Engine*	*9 VAC 5-80-720B*	*CO, NOx, PM_{10}, SO_2, VOC*	*6.72 MMBtu/hr (input)*

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. All portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

A public notice appeared in the Roanoke Times and World-News on September 8, 2002 announcing a 30-day public comment period for this permit. Notice was also provided to West Virginia as an affected state. The public comment period ended on October 8, 2002. During the public comment period, comments were received from EPA and from the applicant. The proposed permit incorporated revisions made to the September 6, 2002 draft in response to these comments. No additional comments were received during EPA's 45-day review of the proposed permit.

Public participation is required for the amended Title 5 permit since monitoring requirements for the combustion turbines (ES-1 - ES-4) may be less stringent to accommodate the changes in how this station is being operated.

The amended permit was advertised for public notice in Covington's newspaper, "The Virginian Review" on July 13, 2006. The required 30-day public notice period closed on August 12, 2006 with no comments received from the public.

This permit was advertised for concurrent review by EPA. The required 45-day review period ended August 27, 2006 with no comments received from EPA>